

MARCH 1, 2003

PROJECT SUMMARY SHEET

PROJECT TITLE NAME: Lake Traverse Watershed Assessment

NAME AND ADDRESS OF LEAD PROJECT SPONSOR:

Roberts Conservation District
PO Box 128
Sisseton, SD 57262-0128

LOCAL CONTACT: Mike Jensen
Roberts Conservation District
PO Box 128
Sisseton, SD 57262-0128
Telephone: (605) 942-7719
Fax: (605) 942-7250

STATE CONTACT: Rich Hanson,
Environmental Program Scientist
SDDENR
523 East Capitol Avenue
Pierre, SD 57501
Telephone: (605) 773-4254
Fax: (605) 773-4068

STATE: South Dakota WATERSHED: Bois De Sioux HUC#: 9020101

PROJECT TYPES : ☐ BASE ☒ WATERSHED ☐ GROUNDWATER ☐ I&E

WATERBODY TYPES

NPS CATEGORY

☐ Groundwater

☒ Agriculture

☐ Hydrologic modification

☒ Lakes/Reservoirs

☐ Urban Runoff

☐ Other

☐ Rivers

☐ Silviculture

☒ Streams

☐ Construction

☐ Wetlands

☐ Resource Extraction

☐ Other

☐ Stowage and Land Disposal

PROJECT LATITUDE 45.70333

LONGITUDE -96.735

SUMMARIZATION OF MAJOR GOALS:

The goal of the Lake Traverse Watershed Assessment Project is to locate and document sources of nonpoint source pollution (primarily excess nutrient loading) in the watershed. This project will produce TMDL targets and goals for Lake Traverse and also document feasible restoration recommendations that may lead to a watershed implementation project.

PROJECT DESCRIPTION:

Lake Traverse is a natural lake (11,530 acres) located between Roberts County, South Dakota and Traverse County, Minnesota. The watershed for Lake Traverse is approximately 729,005 acres. Land use in the watershed is primarily agriculture with a mixture of pasture and crop lands. Lake Traverse is listed on the 2002 303(d) list as a waterbody impaired by algae caused by nutrient enrichment. Through water quality monitoring, stream gauging, stream channel analysis and land use analysis, the sources of impairment to the lake and the reservoir will be documented and feasible recommendations for restoration will be presented in the final project report.

319 funds requested \$57,500

State Fee Funds \$20,000

Other Federal Funds \$ 0

Local Match \$18,300

Total project cost \$95,800

Full Time Employee Equivalents 1.25

2.0 STATEMENT OF NEED

- 2.1 The purpose of this assessment is to determine the sources of impairment to Lake Traverse in Roberts County, South Dakota and Traverse County, Minnesota. The South Dakota watershed of Lake Traverse is relatively small with one significant tributary, Jim Creek. The Minnesota portion of the watershed is much larger (85-90% of the total watershed) and contains numerous intermittent creeks as well as larger tributaries such as the Mustinka River and Steer Creek. Drainage canals also drain to Lake Traverse.

- 2.2 Lake Traverse was targeted for assessment because it is listed on the 303(d) list for impaired waterbodies.

The streams in the watershed drain predominantly agricultural lands with both cropland and grazing acres. Feedlots and winter feeding areas for livestock are present in the watershed. The streams carry sediment loads and nutrient loads.

The watershed area for Lake Traverse is approximately 729,005 acres and lies within Roberts County in South Dakota and Traverse County in Minnesota. There are no municipalities or point source dischargers in the watershed.

The species listed in the federal list of threatened and endangered species are the bald eagle (Haliaeetus leucocephalus), which is listed as threatened and the western prairie fringed orchid (Platanthera praeclara). These species are not likely to be impacted by the assessment work of this project.

- 2.3 See map in Figure 1.

- 2.4 Land use in the watershed is primarily agricultural cropland and grazing. Row crops and hay are the main crops on cultivated lands. Some animal feeding areas are located in the watershed. The major soil associations found in the Lake Traverse watershed are Peever, Forman-Aastad, and the Poinsett-Eckman-Heimdal associations. The Peever association consists of well-drained, nearly level to sloping, loamy soils formed in clayey glacial till. The Forman-Aastad association consists of well-drained and moderately well-drained, gently undulating to steep, loamy soils formed in loamy glacial till. The Poinsett-Eckman-Heimdal association consists of well-drained, nearly level to sloping, silty and loamy soils formed in glacial drift and lacustrine silts.

The average annual precipitation in the watershed is 21.76 inches of which 78% usually falls in April through September. Tornadoes and severe thunderstorms strike occasionally. These storms are local and of short duration and occasionally produce heavy rainfall events. The average seasonal snowfall is 33 inches per year.

- 2.5 The purpose of this assessment is to develop TMDL goals and targets and watershed restoration recommendations for the Lake Traverse watershed. This assessment will serve as the foundation of a Section 319 implementation project.

Lake Traverse Watershed

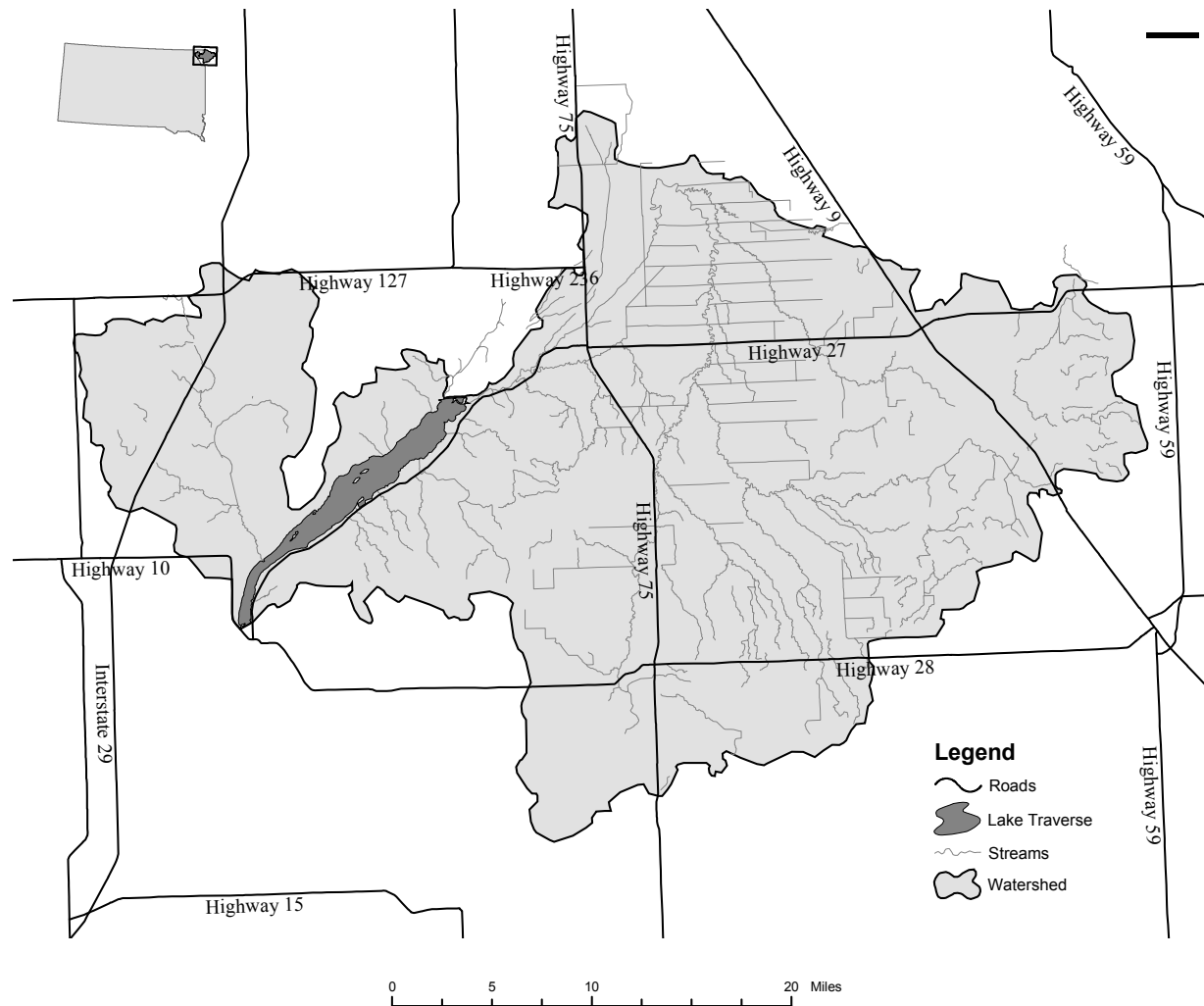


Figure 1. Lake Traverse and its watershed.

ASSESSMENT WORKPLAN

3.0 The Lake Traverse project is a comprehensive assessment that will address sediment and nutrient problems in the watershed. The overall goal is to produce TMDLs for tributaries of Lake Traverse and improve the general water quality in the watershed. This may be accomplished by planning an effective implementation project and/or creating a site-specific standard that realistically reflects the natural conditions found in the watershed. Reducing nonpoint pollutants in the watershed will improve the water quality in the watershed and improve habitat for upland and aquatic species.

3.1 OBJECTIVES AND TASKS

OBJECTIVE 1: Determine a reference condition for comparison with the targeted monitoring sites throughout the watershed.

TASK 1 Selecting the reference site.

Before gauging equipment is installed for the watershed project, the local sponsor and project officer will find a site that is considered least impacted. The site should be representative of the other tributary sample sites. If a reference site cannot be found within the watershed the sponsoring entities may look at watersheds outside the project area but within a reasonable distance and representative of conditions in the project watershed. Consideration for the site should include land use, river morphology, soil type and other pertinent factors.

OBJECTIVE 1 BUDGET

LINE ITEMS	NON-FEDERAL			FEDERAL	TOTAL
	In-Kind	Cash	State Fee Funds	319	
Local Coordinator (@ \$15/hr)				\$1,950	\$1,950
Local Administration	\$150				\$150
Travel	\$200		\$200		\$400
Supplies and Shipping			\$75		\$75
Total	\$350	\$0	\$275	\$1,950	\$2,575

PRODUCTS:

- One reference site that represents the tributaries entering Lake Traverse.

RESPONSIBLE AGENCIES:

Task Responsibility:

Project Coordinator

Project Sponsor

Technical Assistance:

South Dakota Department of Environment and Natural Resources

WORK ACTIVITIES:

Meeting with various agencies to help determine a reference site in the watershed based on agreed-upon parameters.

OBJECTIVE 2: This objective is to determine the current annual load of nutrients and sediment to Lake Traverse. This information will be used to help determine the targets and goals of the TMDL and also be used to verify the results of the land use modeling. The information will be collected at the sites listed in Table 1 and shown in Figure 2.

TASK 2 Installation of Gauging Equipment

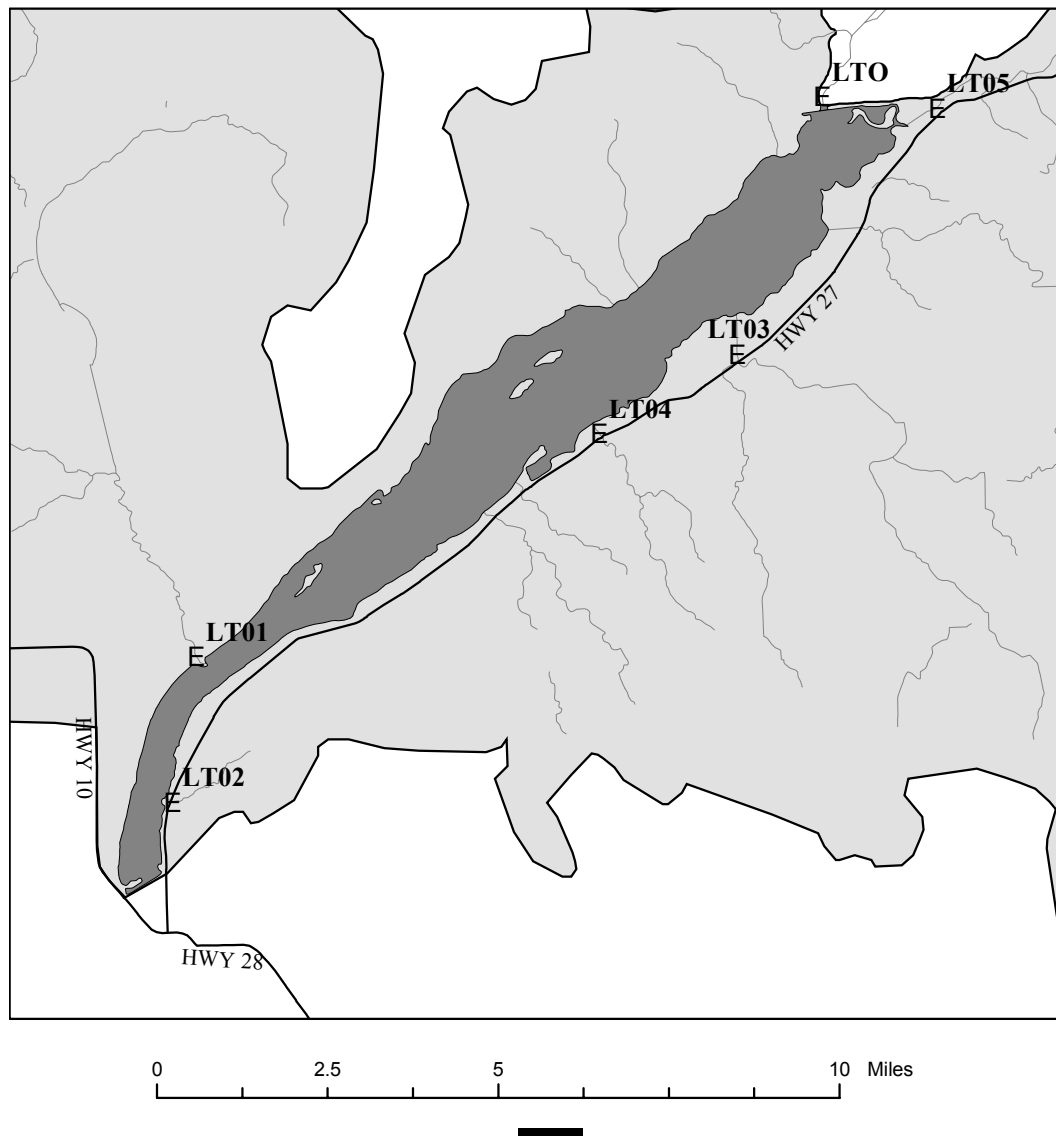
Install water level recorders at 5 tributary sites, 1 outlet and the 1 reference site. The coordinator will maintain a continuous stage record for the project period, with the exception of winter months after freeze-up.

TASK 3 Determine the annual water discharge at each site.

Discrete discharge measurements will be taken on a regular schedule and during storm surges. Discharge measurements will be taken with a hand-held current velocity meter.

Discharges should be taken at different stages and frequently enough to develop a stage discharge rating curve. Discharge measurements and water level data will be used to calculate a hydrologic budget for the stream systems. This information will be used with concentrations of sediment and nutrients to calculate loadings from the watershed.

Lake Traverse Tributary Sampling Sites



Legend

- E Traverse Gages
- Roads
- Lake Traverse
- - - Streams
- Watershed

Figure 2. Tributary sampling sites for the Lake Traverse Watershed Assessment Project.

TABLE 1. Tributary Site Descriptions

Site Name	Site Description
LT01	Jim Creek, entering Lake Traverse from South Dakota.
LT02	Steer Creek, entering Lake Traverse from Minnesota.
LT03	County Ditch 52, entering Lake Traverse from Minnesota.
LT04	Unnamed Trib, just south of County Ditch 52 entering Lake Traverse from Minnesota.
LT05	Mustinka River, entering Lake Traverse from Minnesota.
LTO	Lake Traverse outlet.

TASK 4 Collect water chemistry samples at the sites (Table 1) with the physical, chemical, and bacterial parameters found in Table 2.

Collect water quality samples from 5 tributary monitoring sites, one outlet, and the one reference site. Samples will be collected during spring runoff, storm events, and monthly base flows. Proposed water quality monitoring sites may be found in Figure 2.

TABLE 2. PARAMETERS MEASURED FOR TRIBUTARY SAMPLES:

PHYSICAL	CHEMICAL	BACTERIAL	BIOLOGICAL
Air temperature	Total solids	Fecal coliform	Benthic macroinvertebrate*
Water temperature	Total susp. Solids	<i>E.Coli</i>	Chlorophyll <i>a</i> *
Discharge	Dissolved oxygen		Ash-free dry weight*
Depth	Ammonia		Periphyton*
Visual observations	Un-ionized ammonia		
Water level	Nitrate-nitrite		
	TKN		
	Total phosphorus		
	Total dis. phosphorus		
	Volatile suspended solids		
	Field pH		

*Twice during the project if possible.

Samples will be collected twice weekly during the first week of spring snowmelt runoff and once a week thereafter until runoff ceases (5 samples). Storm events (4 samples) and base flows (4 samples) will be sampled throughout the project period. Approximately 13 samples will be collected at each site for an estimated total number of 91 samples

TASK 5 Collection of discrete samples to help target nonpoint pollution sources.

If loadings are found at the sites throughout the watershed, discrete samples will be collected to determine the source of the pollutant. An

estimated 15 discrete samples will be collected for further targeting of non point source pollutants.

TASK 6 Collection of biological samples at all reference and monitoring sites according to the biological parameters listed in Table 2.

Benthic macroinvertebrate samples will be collected once during the project at each of the tributary monitoring and reference sites. No samples will be collected at the lake outlet due to the influence of the lake/reservoir. Composite samples will be collected according to the department's standard operating procedures for benthic macroinvertebrates. Samples will be collected using either a D-net or a Courtemanch sampler. All samples will be collected during a late summer to fall index period during the project and sent to a private consultant for processing.

Periphyton samples will be collected at each site during July and August. The samples will be collected using the department's standard operating procedures for periphyton collection. Samples will be sent to a private consultant for enumeration and identification. The determination of periphyton chlorophyll *a* and ash-free dry weight of will also be conducted.

OBJECTIVE 2 BUDGET

LINE ITEMS	NON-FEDERAL			FEDERAL	TOTAL
	In-Kind	Cash	State Fee Funds	319	
Local Coordinator (@ \$15/hr)				\$11,700	\$11,700
Local Administration	\$900				\$900
Travel	\$1,200		\$1,200		\$2,400
Biological Analysis		\$3,840			\$3,840
Water Quality Analysis				\$15,900	\$15,900
Equipment				\$5,000	\$5,000
Supplies and Shipping			\$450		\$450
Total	\$2,100	\$3,840	\$1,650	\$32,600	\$40,190

PRODUCTS:

- Installation of all necessary gauging equipment (5 monitoring sites, one lake outlet and 1 reference site)
- Collection of necessary discharge measurements at differing stages (minimum of 8 at each site)
- Collection of water chemistry samples (approximately 13 per site depending on discharge) 91 total
- Collection of macroinvertebrate and periphyton samples. (Approximately 6 macroinvertebrate samples and approximately 12 samples for periphyton identification, chlorophyll *a* and ash-free dry weight).

RESPONSIBLE AGENCIES:

Task Responsibility:

Project Coordinator

Project Sponsor

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

WORK ACTIVITIES:

The collection and organization of all discharge water quality and biological data. All samples will be collected according to the Program's "Standard Operating Procedures for Field Samplers" document.

OBJECTIVE 3: Inlake Data Collection

TASK 7 Inlake water quality sampling.

For most of the project period, monthly samples will be collected at 3 inlake sites in Lake Traverse (Figure 3). During June, July, and August bi-weekly samples will be collected. Surface and bottom samples will be collected at all sites with depths greater than 10 feet. It is assumed one of the three sites is more than 10 feet deep.

The list of inlake parameters is found in Table 3. Data for a depth profile will be collected at both sites each sample run. The minimum parameters to be gathered for the profile will include depth, water temperature, and dissolved oxygen. Additional parameters may also be obtained depending on the sample equipment provided by the state. Approximately 52 inlake samples will be collected in the lake.

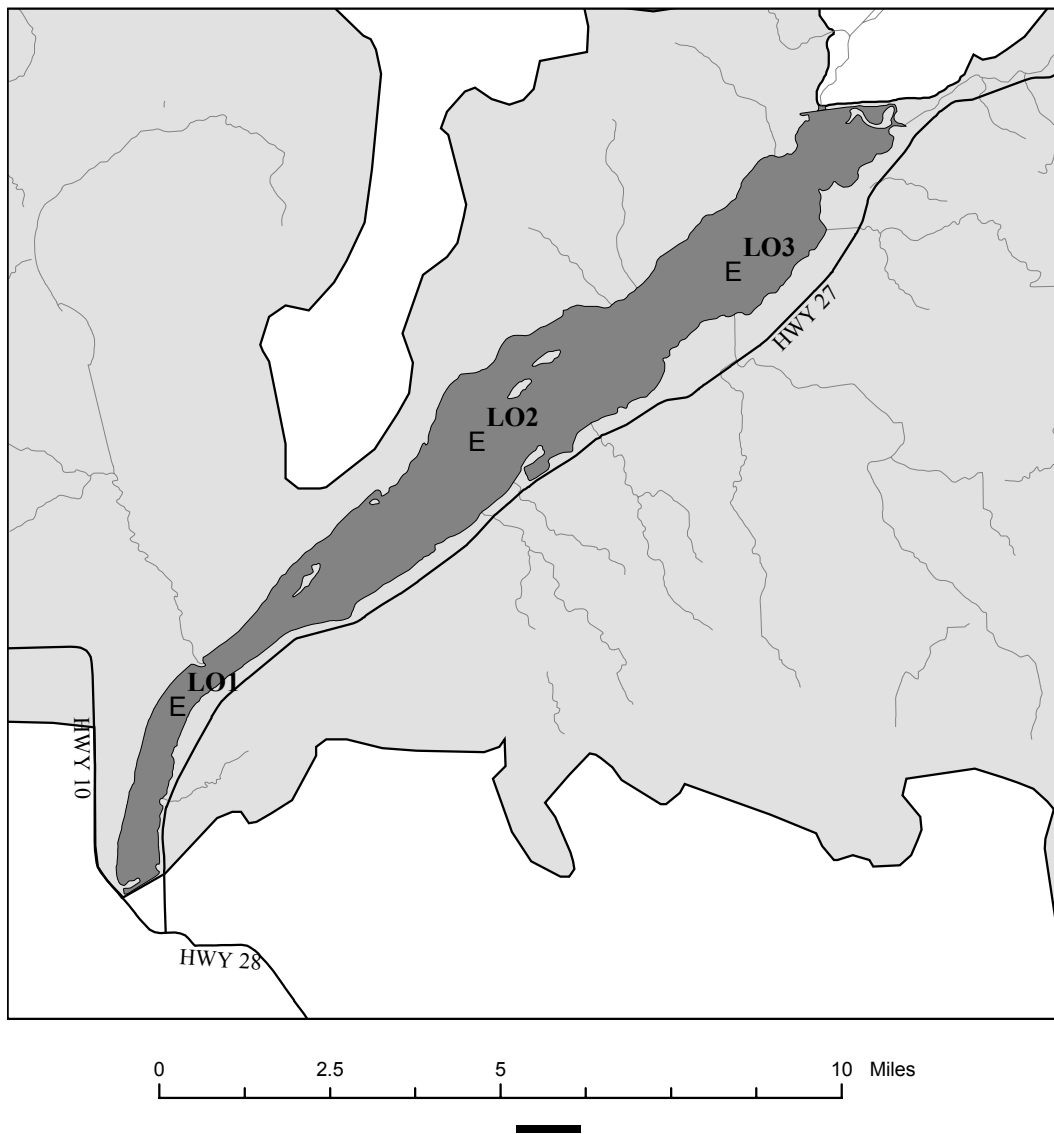
TASK 8 Macrophyte survey.

A macrophyte survey will be completed to determine species and coverage of the macrophytes in the lake. The local coordinator will conduct the survey with assistance from the project office. The procedures for the macrophyte survey can be found in the Water Resource Assistance Programs "Standard Operating Procedures for Field Samplers" document.

TASK 9 Elutriate sampling.

One elutriate sample set will be collected in the lake during the project period. The sample set will consist of three composited receiving water samples and three composited mud samples. The subsample sites will be

Lake Traverse Lake Sampling Sites



Legend

- E Sampling Sites
- Roads
- Lake Traverse
- ~ Streams
- Watershed

Figure 3. Inlake sampling sites for the Lake Traverse Watershed Assessment Project.

equally spaced along the longest fetch of the lake. Parameters to be analyzed for the elutriate samples will be a standard set of contaminants and metals as agreed upon between the State Health Lab and the Water Resource Assistance Program. The samples will be sent to the State Health Lab in Pierre for analysis.

TABLE 3. PARAMETERS MEASURED FOR INLAKE SAMPLES.

PHYSICAL	CHEMICAL	BACTERIAL	BIOLOGICAL
Air temperature	Total solids	Fecal Coliform	Chlorophyll <i>a</i>
Water temperature	Total susp. Solids	<i>E.Coli</i>	
Visual observations	Dissolved oxygen		
Depth	Ammonia		
	Un-ionized ammonia		
	Nitrate-nitrite		
	TKN		
	Total phosphorus		
	Total dis. Phosphorus		
	Volatile suspended solids		
	Field pH		

TASK 10 **Historical Sedimentation Determination**

The project officer and the local sampler will collect water and sediment depths of the lakes to determine the accumulated sediment depths.

The state will use GIS mapping to determine the volume of sediment in the lakes. A map of the current water depth and the total water depth (sum of water and sediment) will be included in the final project report.

OBJECTIVE 3 BUDGET

LINE ITEMS	NON-FEDERAL			FEDERAL	TOTAL
	In-Kind	Cash	State Fee Funds	319	
Local Coordinator (@ \$15/hr)			\$5,850		\$5,850
Local Administration	\$450				\$450
Travel	\$1,200				\$1,200
Biological Analysis					\$0
Water Quality Analysis				\$9,300	\$9,300
Equipment				\$5,000	\$5,000
Supplies and Shipping			\$225		\$225
Total	\$1,650	\$0	\$6,075	\$14,300	\$22,025

PRODUCTS:

- Collect 52 water quality samples.
- Complete a survey and map the macrophytes in the lakes.
- Collect one elutriate sample set (three receiving water and three sediment samples).
- Produce a water depth map and a sediment depth map.

RESPONSIBLE AGENCIES:

Task Responsibility:

Project Coordinator

Project Sponsor

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

WORK ACTIVITIES:

Collect water quality samples, elutriate samples, and enough data to determine the original depth of the lake.

OBJECTIVE 4: QA/QC

TASK 11 QA/QC Procedures for data collection

The collection of all field water quality data will be accomplished in accordance with the “Standard Operating Procedures for Field Samplers” document, South Dakota Nonpoint Source Program.

The number of QA/QC samples is based on a minimum of 10 percent of all samples collected. If the proposed tributary sampling schedule is met, up to 9 blank and 9 replicate QA/QC samples will be collected for water chemistry samples. One QA/QC sample will be collected for benthic macroinvertebrates. Approximately one sample each will be collected for periphyton ID's, chlorophyll *a*, and ash-free dry weight.

If the proposed intake samples are collected for the project, approximately 5 blank and 5 replicate QA/QC samples will be collected.

All QA/QC activities will be conducted in accordance with the Nonpoint Source Program Quality Assurance Project Plan.

The activities involved with QA/QC procedures and the results of QA/QC monitoring will be compiled and reported on in a section of the final project report and in all project reports.

All samples will be collected using the methods described in the “Standard Operating Procedures for Field Samplers” document.

OBJECTIVE 4 BUDGET

LINE ITEMS	NON-FEDERAL			FEDERAL	TOTAL
	In-Kind	Cash	State Fee Funds	319	
Local Coordinator (@ \$15/hr)		\$1,950			\$1,950
Local Administration	\$150				\$150
Travel	\$400				\$400
Biological Analysis		\$460			\$460
Water Quality Analysis		\$2,500		\$2,300	\$4,800
Equipment					\$0
Supplies and Shipping			\$75		\$75
Total	\$550	\$4,910	\$75	\$2,300	\$7,835

PRODUCTS:

- 9 QA/QC sample sets for tributary water chemistry (a set includes one blank and one replicate)
- 1 benthic macroinvertebrate QA/QC sample
- 1 periphyton identification and enumeration QA/QC sample
- 1 periphyton chlorophyll *a* sample
- 1 periphyton ash-free dry weight QA/QC sample
- 5 intake QA/QC sample sets will be collected (a set includes one blank and one replicate)

RESPONSIBLE AGENCIES:

Task Responsibility:

Project Coordinator

Project Sponsor

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

WORK ACTIVITIES:

An approved QA/QC procedure will be utilized on all sampling and field data collected during the Lake Traverse Assessment Project. Please refer to the South Dakota Nonpoint Source Program “Quality Assurance Plan” and the “Standard Operating Procedures for Field Samplers” documents for details of the procedures to be followed.

OBJECTIVE 5: Evaluation of agricultural impacts to the water quality of the watershed through the use of the Annualized Agricultural Nonpoint Source (ANNAGNPS) model.

TASK 12 ANNAGNPS model data collection

The Lake Traverse watershed on the South Dakota side will be modeled using the ANNAGNPS model. ANNAGNPS is a comprehensive land use model that estimates sediment and nutrient loss and delivery and evaluates the impacts of livestock feeding areas. The watersheds will be divided into cells. Each cell will be analyzed after collecting the required information for each cell with additional information collected for animal feeding operations.

The model will be used to identify critical areas of nonpoint source pollution to the surface waters in the watersheds. If critical areas are found the model will be used to determine attainable targets and goals for the TMDL.

The project coordinator will work with the Bois De Sioux Watershed District to estimate reductions expected from the Minnesota side of the watershed. If possible ANNAGNPS will be run on the Minnesota side of the watershed and the data given to the Project coordinator.

OBJECTIVE 5 BUDGET

LINE ITEMS	NON-FEDERAL			FEDERAL	TOTAL
	In-Kind	Cash	State Fee Funds	319	
Local Coordinator (@ \$15/hr)		\$1,050	\$10,150	\$500	\$11,700
Local Administration	\$900				\$900
Travel	\$1,400		\$1,000		\$2,400
Supplies and Shipping	\$275		\$175		\$450
Total	\$2,575	\$1,050	\$11,325	\$500	\$15,450

PRODUCTS:

- Data collected and organized on the lakes' watersheds.
- Critical areas identified and attainable reductions calculated.

RESPONSIBLE AGENCIES:

Task Responsibility:
Project Coordinator
Project Sponsor

Design and Technical Assistance:
South Dakota Department of Environment and Natural Resources
USDA Natural Resource Conservation Service

OBJECTIVE 6: Public Participation

TASK 13 Public participation and involvement will be provided for and encouraged.

Informational meetings for the general public will be held at the start of the project and on at least a quarterly basis thereafter to inform the involved parties of progress on the study. Additional meetings will be scheduled as needed. These meetings will provide an avenue for input from the residents in the area.

News releases will be prepared and released to local news media on a quarterly basis. These releases will be provided to local newspapers, radio stations and TV stations.

A last meeting will be held after a draft of the final report is prepared to get any last public input and comment into the report.

OBJECTIVE 6 BUDGET

LINE ITEMS	NON-FEDERAL			FEDERAL	TOTAL
	In-Kind	Cash	State Fee Funds	319	
Local Coordinator (@ \$15/hr)				\$1,950	\$1,950
Local Administration	\$150				\$150
Travel	\$200		\$200		\$400
Supplies and Shipping	\$75				\$75
Total	\$425	\$0	\$200	\$1,950	\$2,575

PRODUCTS:

- At least 4 public meetings will be held; more if needed.
- At least 4 news releases will be produced; more if needed.

RESPONSIBLE AGENCIES:

Task Responsibility:
Project Coordinator
Project Sponsor

Design and Technical Assistance:
South Dakota Department of Environment and Natural Resources

WORK ACTIVITIES:

Informational meetings will be held on a frequent basis for the general public to inform the involved parties of progress on the study and provide a means of public input.

OBJECTIVE 7: Reporting

TASK 14 Sponsor's Reporting Duties

The sponsor will submit no more than monthly requests for payments along with documented work completed since the last voucher.

The sponsor will fulfill EPA grant requirements by submitting semi-annual updates and annual reports for input into the GRTS reporting system.

Once the field data are collected, an extensive review of the historical and project data will be conducted. The data will be organized and a final report will be submitted to the project officer including all of the data and a financial report of money expended.

TASK 15 Department's Reporting Duties

The project officer will ensure all semi-annual and annual reports are sent to the GRTS reporting officer.

The department will be responsible for a final report for the lake, including hydrologic, sediment and nutrient budgets for the watershed.

The final report will also include the results of the ANNAGNPS modeling of the watershed used in conjunction with the water quality and hydrologic budget to determine critical areas in the watersheds.

The feasible management practices will be compiled into a list of recommendations for the development of an implementation project that will also be included in the final project report.

The TMDL target and goals will be included in the final report of the Lake Traverse Watershed Assessment document.

OBJECTIVE 7 BUDGET

LINE ITEMS	NON-FEDERAL			FEDERAL	TOTAL
	In-Kind	Cash	State Fee Funds	319	
Local Coordinator (@ \$15/hr)				\$3,900	\$3,900
Local Administration	\$300				\$300
Travel	\$400		\$400		\$800
Supplies and Shipping	\$150				\$150
Total	\$850	\$0	\$400	\$3,900	\$5,150

PRODUCTS:

- Semi-annual and annual reports as required by the EPA grant
- Final report to the department from the sponsor
- A final reports including the TMDL submitted to EPA by the Department of Environment and Natural Resources

RESPONSIBLE AGENCIES:

Task Responsibility:

Project Coordinator

Project Sponsor

South Dakota Department of Environment and Natural Resources

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

WORK ACTIVITIES:

All required GRTS reporting will be written according to EPA guidelines. An extensive review and study of the historical and current data will be done to determine the best management practices and hydrologic restoration techniques needed to improve water quality and reduce sediment transport in the lakes' watersheds.

- 3.3 MILESTONE TABLE - see attached milestone.
- 3.4 No special permits are required to do this assessment project.
- 3.5 The Roberts Conservation District is the lead project sponsor for this project. The conservation district is important to this project because of its relationship with landowners in the watersheds. The main problem with this watershed appears to be nutrients resulting in eutrophication of the lake.

4.0 COORDINATION PLAN

- 4.1 The following groups/agencies have agreed through an informal agreement to cooperate in the Lake Traverse Watershed Assessment Project. Additional entities such as the SD Department of Game, Fish and Parks may provide supplemental information.

Roberts Conservation District - Local Project Sponsor.

USDA Natural Resource Conservation Service – Support and technical assistance in acquiring land use data.

US Environmental Protection Agency –Financial support and technical assistance.

South Dakota Department of Environment and Natural Resources – Financial support and technical assistance.

- 4.2 In 2002 Lake Traverse was listed on the 303(d) list for impaired waters. The local conservation district was approached and agreed to accept the responsibility as local sponsor.
- 4.3 Local organizations as well as the SD Nonpoint Source Task Force have expressed support for the Lake Traverse Assessment Project.
- 4.4 This project will coordinate with frequent informal conversations with state, federal, and local government agencies and through quarterly meetings with the conservation district.
- 4.5 Currently there are no other agencies conducting assessment project activities on Lake Traverse.

5.0 EVALUATION AND MONITORING PLAN

- 5.1 The monitoring strategy is explained in Section 3. The project will produce bi-annual progress reports. The sampling and analysis procedures required to complete the tasks within section 3 can be located in the "Standard Operating Procedures for Field Samplers" (SOP) document. The specific locations of these sampling methods within the SOP as they pertain to each task are documented in Table 4 on the following page.
- 5.2 This assessment project consists of a combination of chemical, hydrologic, land use and biological analyses. Monitoring sites will be maintained and sampled on the Lake Traverse watershed. Ambient samples will be collected along with spring runoff and storm events. Stream discharge will be routinely measured. The chemical, physical, and biological parameters to be sampled during this project can be located in Table 2 and Table 3. Loads will be calculated based on the samples and data collected with the

approved methods identified in section 5.1. A TMDL report will be produced for Lake Traverse.

- 5.3 All water quality monitoring will be done in accordance with the approved South Dakota Nonpoint Source Program “Quality Assurance/Quality Control Project Plan” and the “Standard Operating Procedures for Field Samplers” documents.
- 5.4 Results from all water quality monitoring efforts under the Lake Traverse Assessment Project will be reported in the final project report. Data will be managed by the South Dakota Department of Environment and Natural Resources and maintained in a computer database. All sample data will be entered in the US EPA STORET Program by DENR. These data will be used as the foundation of a Section 319 Watershed Implementation Project proposal.

6.0 BUDGET

See attached budget pages

7.0 PUBLIC INVOLVEMENT

See Objective 6.

TABLE 4. Location of sampling and analysis procedures for each applicable task involved with the Lake Traverse Watershed Assessment Project.

TASK NUMBER	TASK DESCRIPTION	ACTIVITY	REFERENCE IN SDWRA-2000 SOP
Task 3	Developing Annual Water Discharge	Collecting a discharge measurement	Section 7.1 pp. 5-9
Task 4	Collect Water Chemistry Samples	Tributary Sampling Procedures	Section 7.1 pp. 1-5 Section 7.1 pp. 9-18
Task 5	Targeting Nonpoint Source Pollutants	Discrete Sample Collection	Section 7.1 pp. 1-18
Task 6	Biological Monitoring	Macroinvertebrate Sampling	Section 15.1
Task 6	Biological Monitoring	Periphyton Sampling	Section 7.5 pp. 2
Task 7	In-lake Sampling.	In-lake Sampling.	Section 7.0 pp. 1-12
Task 8	Determine Macrophyte Coverage	Conduct a macrophyte survey	Section 7.2
Task 9	Elutriate Sampling	Elutriate Sampling	Section 7.3 pp. 1-4
Task 10	Sediment Depth Determination	Sediment Depth Determination	Section 9.0 pp. 1-9
Task 11	Quality Assurance/Quality Control	Quality Assurance Quality Control Sampling	Section 10.0
Task 12	AGNPS Model Data Collection	AGNPS Model Data Collection	Section 17.0

LAKE TRAVERSE ASSESSMENT PROJECT BUDGET			
PART 1: FUNDING SOURCES	2003	2004	TOTAL
EPA SECTION 319 FUNDS	\$14,000	\$43,500	\$57,500
NONFEDERAL FUNDS*	\$9,000	\$29,300	\$38,300
TOTAL BUDGET	\$23,000	\$72,800	\$95,800

*INCLUDES MULTIPLE COMMUNITY ORGANIZATIONS AND AGENCIES

Lake Traverse Watershed Assessment Budget.

ITEM	Total	Federal	Nonfederal	EPA 319	State Fee Funds	Local Total	Local Cash	Local In-kind
Local Coordinator (2,600 @ \$15/hr)	\$39,000	\$20,000	\$19,000	\$20,000	\$16,000	\$3,000	\$3,000	
Local Administration	\$3,000		\$3,000			\$3,000		\$3,000
Travel	\$8,000		\$8,000		\$3,000	\$5,000		\$5,000
Biological Analysis *	\$4,300		\$4,300			\$4,300	\$4,300	
Water Quality Analysis **	\$30,000	\$27,500	\$2,500	\$27,500		\$2,500	\$2,500	
Equipment	\$10,000	\$10,000	\$0	\$10,000				
Supplies and Shipping	\$1,500		\$1,500		\$1,000	\$500		\$500
Total	\$95,800	\$57,500	\$38,300	\$57,500	\$20,000	\$18,300	\$9,800	\$8,500
		60%	40%					

*Biological Analysis

Macroinvert. 6 @ \$200	\$1,200
Periphyton ID 12 @ \$200	\$2,400
Periphyton ash-free dry weight	
12 @ \$20	\$240
QA/QC macroinvert. 1 @ \$200	\$200
QA/QC periphyton ID 1 @ \$200	\$200
QA/QC periphyton ash-free dryWeight 1 @ \$20	\$20
Subtotal	\$4,260

**Water Quality Analysis

6 sites - 91 samples @ \$150	\$13,650
Inlake analysis 52 @ \$150	\$7,800
Discrete samples 15 @ 150	\$2,250
QA/QC trib. samples 18 @ \$150	\$2,700
QA/QC inlake samples 10 @ \$150	\$1,500
QA/QC discrete samples 4 @ \$150	\$600
Elutriate sample	\$1,500
	\$30,000

Lake Traverse Watershed Assessment Project
Roberts Conservation District
Milestone Chart
2003-2005

	2003				2004												2005		
	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
Objective 1 - Reference Site Selection																			
Objective 2 - Tributary Sampling																			
Objective 3 - Inlake Data Collection																			
Objective 4 - QA/QC																			
Objective 5 - ANNAGNPS																			
Objective 6 - Public Participation																			
Objective 7 - Reporting																			

SOUTH DAKOTA NONPOINT SOURCE PROGRAM
QUALITY ASSURANCE PROJECT PLAN

SUBMITTED BY:

SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF FINANCIAL AND TECHNICAL ASSISTANCE
WATER RESOURCES ASSISTANCE PROGRAM

Prepared by: Robert Smith
February, 2001

Project Title: Lake Traverse Watershed Assessment Project

APPROVED BY:

South Dakota Watershed Protection Program
Environmental Senior Scientist, Assessment Section

Date

South Dakota Watershed Protection Program
Project Officer

Date

South Dakota Watershed Protection Program
Quality Assurance Coordinator

Date

South Dakota DENR Quality Assurance Officer

Date